

ART. I.—*On Australian Aphodiides (Coleoptera).*

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[Read, 8th March, 1923.]

The Australian Aphodiides were revised in these Proceedings for 1904 by the late Rev. T. Blackburn, when he stated that all the species described as new could be placed in their genera "strictly on the characters cited" in the table of genera supplied. The new species here dealt with have also been referred to genera in accordance with that table, although it separates two species: *Ataenius aphodioides* and *Aphodius heterodoxus*, which at first glance appear to be congeneric. Since the revision the following species have been recorded as Australian:

- Aphodius ambiguus*, Boh., Freg. Eng. Resa, ii. (1), 1858, p. 51, *frenchi* Blackb.
A. distinguendus, Schmidt, Deutsch. Ent. Zeit., 1910, p. 354, (*Mendidus*).
A. sorex, Fab., Ent. Syst., i., 1792, p. 23. Introduced.
Dialytes granifer, Schmidt, Soc. Ent. Zurich, 1909, xxiv., p. 66.
Odochilus syntheticus, Har., Ann. Mus. Civ. Gen., x., 1877, p. 99; Schmidt, Wyts. Gen. Ins. Fasc. cx., 1910, pl. 3, fig. 40.
Phycochus graniceps, Broun, Man. N.Z. Col., iii., 1886, p. 771.
P. sulcipennis, Lea, Proc. Linn. Soc., N. S. Wales, 1904, p. 89, pl. 4, fig. 10.
Rhyssemus blackburni, Clouet, Mem. Soc. Ent. Belg., 1901, p. 50, pl. 3, fig. 18.

I do not know *Dialytes* and *Odochilus*, but *Phycochus* is distinct by the eyes being absent or very minute and *Rhyssemus* (a species of which is named below) by having six longitudinal ridges on the prothorax.

APHODIUS AMBIGUUS, Boh.

A. frenchi, Blackb.

Widely distributed in both Africa and Australia, but first named from the former. Two other synonyms (*A. tarsalis*, Schmidt and *A. brevitarsis*, Pering) and one variety (*A. accola*, Kolbe) are noted in Junk's Catalogue of the sub-family (1910, part 20).

APHODIUS HETERODOXUS, sp. nov.

Bright reddish-castaneous, most of prothorax infuscated.

Head strongly convex, base impunctate, then with a few large punctures, but apical two thirds closely covered with small granules.

Prothorax about four-fifths as long as wide, sides moderately rounded, front angles slightly produced, hind ones rounded, lateral margins slight, basal ones slight at sides and not traceable across middle; with large and sparsely distributed punctures, mixed with a few minute ones. Elytra almost parallel-sided to beyond the middle-punctate-striate, interstices evenly convex and much wider than striae, even on apical slopes. Under-surface with pale irregularly distributed hairs. Metasternum between middle and hind coxae with an elliptic depression, its middle with a narrow-deep stria; the sides with coarse, asperate punctures. Apical segment of abdomen with a median depression. Middle and hind femora dilated in middle, their tibiae strongly dilated at apex. . .

Length, 4.75—5mm.

Hab.—South Australia: Port Augusta.

I am somewhat dubious as to the generic position of this species. The elytra are certainly without a basal edging (a specimen has been dissected to make sure of this), so by Blackburn's table it cannot belong to *Atacnius* or *Psammadius*; the middle coxae are much less widely separated than in *Proctammodes sculptus* or *P. minor*, but more than in the British *Aphodius granarius* or *A. nutidulus*. The separation, however, is very little more than in *A. subterraneus*, so at present it appears desirable to refer it to *Aphodius*. In general appearance it is much like *Psammadius zictzi*. On one specimen the prothorax, except at the sides and in front, is almost black. The punctures in the elytral striae are small and shallow, but, owing to "waterlogging," from some directions they appear to be large, subquadrate, and almost as wide as the interstices.

A specimen from New South Wales (Broken Hill, Simson's collection) possibly belongs to this species, but its head is partly infuscated with smaller and less defined granules; prothorax deep black except at the sides, with decidedly smaller and even sparser punctures; elliptic depression of metasternum shallow, depression on apical segment of abdomen smaller and shallower, and teeth of front tibiae less acute. Some of these differences, however, may be sexual.

APHODIUS INTEGRIFRONS, sp. nov.

Of a dingy livid colour, but shining, antennae and femora paler, base of head deeply infuscated, most of prothorax feebly infuscated, tibiae somewhat reddish. Under-surface with long yellowish setae, mixed with sparse, whitish pubescence; legs with setae only; elytra with very fine, depressed setae.

Head almost semicircular, but suddenly narrowed near front of eyes; apex not incurved at middle, sides gently elevated; base almost impunctate, elsewhere with moderately large, scattered punctures, denser between eyes than elsewhere. Prothorax almost twice as wide as long, sides evenly rounded, with thickened margins, front angles slightly produced, hind ones rounded off, base bisinuate, finely margined at sides but not in middle; with scattered punctures, about as

large as those on head. Elytra almost parallel-sided to beyond the middle; with narrow geminate striae, interstices wide, feebly separately convex, each with a row of small, setiferous punctures. Metasternum with a deep median stria; with sparse punctures, becoming more numerous but not crowded on sides,

Length, 7.5 mm.

Hab.—Queensland: Cairns (H. Hacker).

In Blackburn's table this species would be placed with *A. lividus*, to which it is not at all close, but it is really allied to *A. suberosus*, *A. victoriae* and similar species, although the elytral interstices are nowhere tuberculate or alternately elevated; there is a single row of minute depressed setae on each interstice.

APHODIUS TRICOLOR, sp. nov.

Black, parts of under-surface obscurely diluted with red, elytra dark red, sides and suture infuscated, anteunae reddish, club darker; legs flavous, some parts infuscated or reddish. With rather long, suberect, reddish hairs.

Head with coarse and fairly dense punctures, margins elevated throughout, truncated in front, dilated near eyes. Eyes with distinct facets. Prothorax almost twice as wide as the median length, sides strongly rounded, notched at base, median line distinct near base, vanishing before apex; punctures coarse and rather dense but somewhat irregular. Scutellum almost impunctate. Elytra with rather deep and narrow striae, odd interstices conspicuously and evenly elevated and with coarse punctures, even interstices wider than the others, and with dense, asperate punctures of two sizes. Front tibiae with two strong teeth and one small one, and with several denticulations.

Length, 5 mm.

Hab.—New South Wales: Collarenebri (Dr. J. F. Illingworth from S. W. Jackson).

The punctures on the pronotum are large but not very even, so that it is doubtful as to whether Blackburn would have associated this species with *AA*, *BB*, *C*, or *CC* in his table; it is, however, very distinct from all the species dealt with by him, by the black coarsely sculptured prothorax, and red elytra with strong and almost even elevation of the odd interstices. The notch on each side of the prothorax is much more pronounced on one specimen than on another.

APHODIUS BICRENULATUS, sp. nov.

Of a livid brown and shining, sides and apical slope of elytra and parts of under-surface and of legs paler. Upper-surface with depressed and rather sparse pale pubescence, under-surface and legs with still sparser pubescence, and a few short setae.

Head with crowded and fairly large punctures, a short transverse ridge near each eye, sides dilated and somewhat sinuous, apex strongly incurved at middle. Prothorax about three-fifths as long

as wide, sides widest near base and rather widely margined, front angles produced, hind ones rounded, base finely margined, median line distinct except at apical fifth; punctures about as large as on head, but much less numerous. Elytra with sides feebly rounded to beyond the middle, interstices gently separately convex, the even ones slightly wider than the odd ones; with irregular rows of distinct punctures, each interstice, except the sutural and lateral ones, crenulate on each side. Metasternum with a feeble median line; with sparse punctures, becoming more numerous on sides but not crowded.

Length, 5 mm.

Hab.—Western Australia: Mount Barker (R. Helms).

The elytral striae from some directions appear to be much wider than they really are, and each to contain a row of large transverse punctures, but this is due to the crenulation on each side of each interstice, except the sutural and lateral ones, which are crenulate on one side only. I know of no closely allied species from Australia or elsewhere.

APHODIUS PARVONIGER, sp. nov.

Deep black and shining, sides of prothorax and tips of elytra with some obscure livid markings, parts of legs obscurely diluted with red.

Head with minute punctures, fairly distinct near base, but scarcely visible, if at all, elsewhere; front slightly incurved to middle. Prothorax about four-fifths as long as wide, sides moderately rounded and feebly margined, base more strongly rounded with margins traceable only on sides, front angles scarcely produced, hind ones widely rounded off; with fairly large and numerous but not crowded punctures, becoming smaller in front. Elytra with sides feebly dilated to beyond the middle, punctate-striate, punctures rather large but shallow, and with a lined appearance; interstices rather strongly convex and wider than striae, except posteriorly, where they are narrower. Metasternum subopaque and with shallow asperate punctures on sides, shining and with minute ones elsewhere; a narrow-deep median stria.

Length, 3—3.5 mm.

Hab.—Western Australia: Swan River (J. Clark and A. M. Lea).

A small, narrow, deep black species, at first appearing to belong to *Atacnius*, but elytra without basal edging, and shoulders rounded and unarmed. On two specimens the front sides of the prothorax are obscurely pale, on three others the pale parts can scarcely be traced; on one of the former, and one of the latter the pale markings on the apical slope of the elytra are rather sharply defined, on the others they are feeble and almost, or quite, confined to the apical margin.

ATAENIUS CRENATIPENNIS, Macl. (*Ammoecius*).

A. speculator, Blackb.

A. crenatipennis was described from Gayndah, *A. speculator* from the Victorian Alps. Blackburn, however, subsequently identified specimens from the Clarence River as belonging to *speculator*, and the species is a widely distributed one, occurring in Queensland, New South Wales, Victoria, South and North-Western Australia, and Lord Howe Island. It is the only conspicuously setose species of the genus from Australia; a few others have elytral setae but they are so small as to be scarcely visible, and only from the sides.

ATAENIUS OBSCURUS, Macl. (*Ammoecius*).

The specimens that Blackburn thought¹ might belong to this species are not even near it; in his table the type would be referred to AA, BB, and perhaps to CC, but it is very different from *A. walkeri*, the only species referred to CC.

ATAENIUS BASICEPS, sp. nov.

Black, opaque, legs dull red, antennae and tarsi paler.

Head with coarse, crowded punctures, on a rather narrow and sharply defined basal space, front with fairly numerous small punctures, between it and the basal punctures smooth and scarcely visibly punctate. Prothorax at apex almost twice as wide as the median length, front angles obtusely produced, sides with moderate margins; punctures coarse and crowded as on base of head. Elytra almost parallel-sided to near apex, each shoulder with a short oblique spur; narrowly striate, and narrowly costate, between each costa and stria a row of large punctures, and granules. Metasternum with coarse, crowded punctures, and a narrow median line.

Length, 4—4.5 mm.

Hab.—New South Wales: Albury (Rev. T. Blackburn).

The punctures at the base of the head are about the same size as on *A. koebelci* and *A. imparilis*, but on those species the punctures on the convex median part are very dense and conspicuous, on the present species that part is practically impunctate. The sides of the head and of the prothorax are very narrowly and obscurely reddish. The elytral sculpture appears to vary with the point of view, from directly above each costa and stria appears to be very narrow, with a row of large intervening punctures; each of the punctures with a granule where it adjoins the stria; from behind, the punctures are much less evident, but the granules and alternate costae are distinct; from the sides the striae and punctures disappear, and a row of evenly spaced granules alternate with a narrow costa. A specimen from Tasmania (Simson collection) probably belongs to the species, but is smaller and the sculpture between its elytral striae and costae is less defined.

1. Blackb., Proc. Roy. Soc. Vic., 1904, p. 162.

ATAENIUS DUPLOPUNCTATUS, sp. nov.

Black, shining, legs dull red, antennae paler. Prothorax fringed with pale setae.

Head rather convex, with moderately large punctures at base, smaller and denser elsewhere, but with a tendency to become subgranulate at the sides. Prothorax about three-fifths as long as wide, sides gently rounded, front angles slightly produced, hind ones rounded off, sides and base finely margined; with small and rather dense punctures, interspersed with larger ones, except about apex in middle. Elytra parallel-sided to near apex, shoulders feebly armed; striate-punctate, interstices gently and evenly convex, crenulate internally, and wider than striae, but posteriorly narrowed so as to be no wider than striae. Metasternum with a narrow deep median stria, an oblique and rather shallow depression near each hind coxa; with small and fairly dense punctures near sides, elsewhere almost impunctate. Mesosternum with a narrow, shining, intercoxal carina.

Length, 5—6 mm.

Hab.—Western Australia: Parkerville (J. Clark); South Australia: Port Noarlunga and Mount Lofty (N. B. Tindale); Victoria: Forrest (H. W. Davey), Noble Park and Linga (F. E. Wilson).

The largest of all the shining black species from Australia; on most of the specimens the front of the head is obscurely reddish. The parts about the middle coxae, and the flanks of the prosternum are moderately densely clothed.

ATAENIUS LAEVIFRONS, sp. nov.

Black, shining, legs more or less obscurely reddish, antennae palpi and tarsi paler. Sides of prosternum moderately densely clothed.

Head with fairly dense, and not very large, but sharply defined punctures about base, smaller and sparser elsewhere, and scarcely or not at all traceable in middle. Prothorax about three-fifths as long as wide, sides gently rounded, front angles slightly produced, hind ones rounded off, sides and base rather narrowly but conspicuously margined; with fairly large and dense punctures, becoming crowded on sides, but absent from a narrow, polished, apical space. Elytra parallel-sided to near apex, shoulders slightly armed; striate-punctate, interstices gently and evenly convex, strongly crenulate internally, much wider than striae, but posteriorly becoming very narrow and distinctly narrower than striae. Metasternum with a narrow, deep, median stria, an oblique impression containing numerous punctures near each hind coxa; sides with crowded and rather small, asperate punctures, a few large sharply defined ones about middle. Mesosternum with a very narrow carina on intercoxal process.

Length, 4.25—4.5 mm.

Hab.—Queensland: Stewart River (W. D. Dodd).

About the width of *A. duplopunctatus*, but shorter, head with smaller punctures, no small punctures amongst the larger ones on prothorax, and parts of under-surface different. It is larger than *A. eurynotus*, punctures of head in middle scarcely visible, and crenulation of elytral interstices more pronounced. On some specimens the legs, except the tarsi, are almost black.

ATAENIUS EURYNOTUS, sp. nov.

Black, shining, antennae palpi and legs reddish, sides of head and of prothorax obscurely reddish.

Head with small, dense punctures, becoming larger and more sharply defined about base. Prothorax almost twice as wide as long, sides slightly rounded, front angles obtusely produced, hind ones oblique, lateral and basal margins distinct; punctures of moderate size and rather crowded on sides, sparse in middle, and absent from a narrow, shining space at apex, with a few minute punctures scattered about. Elytra parallel-sided to near apex, shoulders feebly armed; striate-punctate, interstices gently convex and wider than striae, crenulate internally, posteriorly becoming much narrower, and narrower than striae. Metasternum with a deep impress on at base and apex, representing a median stria, a shallow oblique impression filled with small punctures near each hind coxa, sides with small crowded punctures, a few fairly large ones about middle.

Length, 4 mm.

Hab.—Queensland: Normanton (R. Kemp).

A short, wide species, in general appearance fairly close to *A. semicaecus*, but slightly wider, and without minute granules in front. The deep median impressions on the metasternum from most directions appear to be disconnected, but from some directions they appear to be very feebly connected on each of the two specimens taken by Mr. Kemp.

ATAENIUS FAVUS, sp. nov.

Black, shining; antennae, palpi and legs reddish.

Head rather strongly convex, with rather sharply defined punctures at extreme base, elsewhere impunctate. Prothorax almost twice as wide as long, front angles obtusely produced, hind ones gently rounded, sides feebly rounded and moderately margined, base feebly margined; with sharply defined punctures of moderate size, denser on sides than elsewhere, and absent from a narrow, shining space at apex. Elytra with sides feebly rounded to beyond the middle, shoulders scarcely armed; striate-punctate, interstices gently convex, wider than striae, and rather feebly crenulate internally, posteriorly becoming thin and narrower than striae. Metasternum with a narrow, deep stria in middle, a shallow oblique impression with a few small punctures near each hind coxa; sides opaque and with minute punctures, middle shining and impunctate. Metasternum with a very fine carina on intercoxal process.

Length, 2.5—2.75 mm.

Hab.—Western Australia: Vasse (A. M. Lea).

A small, rather strongly convex species, with clypeal flanges rather wider than usual; it is about the size of *A. walkeri*, but is shining, prothorax with much sparser and considerably larger punctures, elytral interstices much wider, &c.; at first glance it appears to belong to *Aphodius*, but the elytra are margined at the base.

ATAENIUS SPINIPENNIS, sp. nov.

Black, subopaque, sides of clypeus, palpi and legs obscurely reddish, antennae paler.

Head with crowded and small punctures, becoming somewhat larger at base, and sparser but more sharply defined on sides of clypeus. Prothorax about three-fifths as long as wide, sides feebly dilated to near apex, front angles rounded and slightly produced, hind ones oblique, lateral and basal margins feeble; with rather small, crowded punctures. Elytra parallel-sided to near apex, shoulders acutely spined; narrowly striated, interstices strongly crenulated internally, ridged externally. Metasternum with a narrow, deep median stria, some large punctures near it, a shallow oblique impression containing small punctures.

Length, 3.5—4 mm.

Hab.—Queensland: Thursday Island (N. B. Tindale).

From some directions the elytra appear to have narrow interstices separating rows of fairly large even granules, from others to have rows of strong subquadrate punctures, but these appearances are really due to the strong crenulation of the inner part of each interstice; on the apical slope, however, the interstices are narrowly costate and separate rows of large punctures. On four of the eight specimens before me the elytra and under-surface are of a rather dingy red, probably from immaturity. The shoulders are more acutely spined than on any other known Australian species of the genus.

ATAENIUS INSULARIS, sp. nov.

Black, shining; sides of clypeus and legs more or less obscurely reddish, antennae paler.

Head with rather small, crowded punctures, but suddenly becoming larger near base. Prothorax almost twice as wide as long, sides feebly rounded, front angles rounded, and slightly produce, hind ones oblique or slightly coarctate, lateral and basal margins fine; with dense and rather small but sharply defined punctures, becoming crowded on sides, especially in front angles, and very fine across middle of apex. Elytra parallel-sided to near apex, shoulders rather feebly armed: striate-punctate, interstices evenly convex and wider than striae, posteriorly becoming narrower than striae. Metasternum with a narrow, deep median stria, middle shining but with a few distinct punctures near base, a shallow oblique impression filled with small punctures near each hind coxa; sides opaque, with small

crowded punctures. Mesosternum with a very narrow ridge on intercoxal process.

Length, 3.5—3.75 mm.

Hab.—Queensland: Moa or Bank's Island (G. F. Hill).

With the general appearance of *A. macilentus*, but head with dense and quite conspicuous punctures on the convex median part; also like large *A. torridus*, but base of head with larger punctures, sharply defined in front from the smaller ones, so as to be like those of *A. basiceps* on a reduced scale; the prothorax is more convex longitudinally than on *A. persimilis*; the head not granulate in front distinguishes from *A. semicaecus*; *A. nudus* has sparser prothoracic punctures and head scarcely visibly punctate in middle. The crenulation of the elytral interstices is so slight that from most directions the punctures appear to be confined to the striae. On one specimen each of the abdominal segments has a shining impunctate space across its apical third, on a second specimen the punctures are evenly distributed; the difference is probably sexual. A specimen from Normanton (R. Kemp) possibly belongs to this species, but its prothorax is slightly wider, with distinctly sparser punctures (except that they are crowded on the sides), and elytral striae deeper, with their punctures even less distinctly crenulating the interstices.

ATAENIUS PERSIMILIS, sp. nov.

Blackish; sides of head, antennae, palpi and legs reddish.

Head with fairly dense sharply defined punctures of moderate size near base, elsewhere obsolete granulate. Prothorax about twice as wide as long, front angles slightly produced, hind ones rounded, lateral and basal margins slight, with fairly dense, sharply defined punctures, becoming crowded on parts of sides, a narrow space across apex polished and with minute punctures. Elytra almost parallel-sided to beyond the middle, shoulders very feebly armed; interstices apparently rather narrow, strongly creulate internally, and slightly so externally. Metasternum with a deep, narrow median stria, no punctures adjacent to it, a shallow oblique impression with small punctures near each hind coxa; sides opaque and with crowded punctures. Mesosternum with a narrow median carina on intercoxal process.

Length, 3.25—3.75 mm.

Hab.—Northern Territory: Roper River (N. B. Tindale), Tenant's Creek (J. F. Field); North-Western Australia: Derby (W. D. Dodd).

In general appearance like *A. latericollis*, but consistently larger, prothorax with somewhat larger punctures and elytral interstices more strongly crenulate; from *A. semicaecus* and *A. goyderensis* it differs in being smaller, less polished, cephalic granules less sharply defined, prothoracic punctures larger and less crowded, and elytra more strongly crenulate; from *A. semicornutus* in being somewhat wider, with finer sculpture of head, elytra different and prothorax

without trace of a median line. The strong crenulation of the interstices causes the elytra to appear to have strong punctate-striae, wider than the interstices, but allowing for the crenulation the interstices are really wider than the striae, except posteriorly, where they are narrower and costiform.

ATAENIUS MICROTRICHOPTERUS, sp. nov.

Black or blackish and moderately shining; front and sides of head, antennae, palpi and legs more or less reddish. Elytra with series of very minute setae, similar setae on sides of prothorax.

Head with dense and rather sharply defined punctures of moderate size, becoming longitudinally confluent in middle. Prothorax almost twice as wide as long, front angles feebly produced, basal ones oblique, sides feebly margined and very feebly crenulated; with dense punctures of moderate size, becoming smaller (but still well-defined) in front, and crowded on sides; median line distinct at base and traceable to beyond the middle. Elytra parallel-sided to near apex, shoulders rather acutely armed; interstices fairly wide near sides, rather narrowly ridged and strongly crenulated towards suture, each with two rows of minute setiferous punctures. Metasternum with a deep median stria, adjacent to which are sharply defined but not crowded punctures, a shallow oblique impression filled with small punctures near each hind coxa; sides with crowded punctures. Length, 3.5—4 mm.

Hab.—Queensland: Cunnamulla (H. Hardcastle).

In Blackburn's table would be associated with *A. australis*, from which it differs in having the elytral interstices less narrow near the suture, and metasternum with much sparser punctures, those of the abdomen also decidedly smaller and sparser; it is somewhat wider than *A. semicornutus*, prothorax less convex, with decidedly denser and somewhat smaller punctures, and those on elytra more distinct; the prothorax with remnant of a median line distinguishes it from *A. deserti*. The setae of the upper-surface are very thin and short, and are distinct only from the sides. The species is close to a specimen marked as a cotype of *A. sparsicollis*, but is slightly wider and black, the elytral interstices, in addition to their inner crenulation, have two rows of small punctures; it is to be noted, however, that on the cotype of *sparsicollis* the punctures on the prothorax are very little different from those on *A. australis*, instead of being very different as noted in the description; I do not regard the name, however, as a synonym of *australis*. Four specimens from Australia (Simson's collection) and one from New South Wales (Belmore, F. Taylor) possibly belong to this species, but are smaller (2.75—3 mm.), on three of them (including the Belmore specimen) the median line of the prothorax is represented by a scarcely visible basal remnant, from the others it is quite absent.

ATAENIUS INTEGRICOLLIS, sp. nov.

Black or blackish and somewhat shining; front of head, antennae, palpi and legs more or less reddish.

Head with dense and well-defined punctures at base and on sides of clypeus, elsewhere impunctate or almost so. Prothorax about three-fifths as long as wide, front angles slightly produced, hind ones rounded, margins of base and sides moderate; with dense and sharply defined but not very large punctures, smaller in front than near base, and crowded on sides. Elytra parallel-sided to near apex, shoulders feebly armed, interstices rather strongly ridged externally, strongly crenulated internally. Metasternum as described in preceding species. Length, 3.5—4 mm.

Hab.—Queensland: Cunnamulla (H. Hardcastle).

In general appearance close to the preceding species, but upper-surface glabrous, head with much smaller punctures (scarcely visible) on convex median portion, and prothorax without median line: in Blackburn's table it would be associated with *A. deserti*, from the description of which it is at once distinguished by the cephalic punctures; from *A. macilentus* it differs in the denser punctures of prothorax and very different elytra. From some directions the elytra appear to have rows of large punctures, alternating with narrow costae; on altering the point of view the punctures appear to change to regular rows of small granules; these appearances are due to the crenulated inner portion of each interstice being below its outer portion. From some directions the basal portion of the prothorax appears finely multigranulate. On several specimens the elytra, wholly or in part, front and sides of prothorax, and most of under-surface, are of a more or less dingy reddish-brown.

ATAENIUS ILLAETABILIS, sp. nov.

Black, opaque; front of head, antennae, palpi and legs reddish.

Head with crowded punctures, becoming longitudinally confluent in the middle, and sparse on clypeus. Prothorax almost twice as wide as long, front angles somewhat produced, hind ones oblique; with crowded punctures throughout. Elytra parallel-sided to near apex, shoulders slightly armed; interstices obtusely ridged externally, crenulated internally. Under-surface with crowded punctures throughout. Mesosternum with a deeply impressed, narrow median line. Length, 3—3.5 mm.

Hab.—North-Western Australia: Fortescue River (W. D. Dodd).

An opaque species, except that the under parts are somewhat shining, which in Blackburn's table of the genus would be associated with *A. walkeri*, from which it differs in being consistently larger, prothorax slightly wider and less parallel-sided. The under-surface of most of the specimens (of which twenty-four were taken by Mr. Dodd) is of a dingy reddish-brown; two specimens are entirely pale reddish-brown, probably due to immaturity. The sides of the prothorax, as seen from below, are distinctly crenulated or serrated on the basal half only, but from above this is scarcely evident; from some directions the elytral interstices appear to be wider than the striae, and these to contain distinct punctures; from others, however, the punctures are seen to be really due to the crenulation of the depressed inner portion of each interstice.

ATAENIUS APHODIOIDES, sp. nov.

Bright reddish-castaneous, antennae somewhat paler, head, except in front, and most of prothorax somewhat infuscated.

Head moderately convex, with crowded and rather small but sharply defined punctures, becoming larger and subgranulate in front. Prothorax almost twice as wide as long, sides moderately rounded, front angles produced, the hind ones rounded, lateral and basal margins slight; with fairly dense punctures, about as large as at base of head but less crowded, and interspersed with numerous fairly large ones. Elytra subparallel-sided to near apex, base finely margined, shoulders unarmed; punctate striate, punctures slightly encroaching on interstices, these gently convex and much wider than striae, even on apical slope; with small punctures more distinct near sides than near suture. Metasternum with a narrow median stria, minute punctures near it, a very feeble oblique impression near each hind coxa; sides with fairly dense but inconspicuous punctures. Length, 4.5—4.75 mm.

Hab.—Western Australia: Cue (H. W. Brown).

With the general appearance of *Aphodius heterodoxus*, but elytra with basal edging, and prothorax with crowded punctures; also with the general appearance of *Psammodius zietzi*, but head with granules only in front and hind femora much less dilated, although rather more strongly than is usual in *Ataenius*.

PROCTAMMODES METASTERNALIS, sp. nov.

Black, highly polished; front of head and parts of antennae and of legs more or less obscurely reddish.

Head almost impunctate at base, with fairly numerous and small but sharply defined punctures between eyes, becoming denser elsewhere but very minute in middle; sides moderately curved; front strongly incurved to middle. Prothorax about four-fifths as long as wide, sides gently rounded and finely margined, front angles obtusely produced, hind ones rounded, base rather strongly rounded in middle and finely margined only at sides; punctures of moderate size, sharply defined and not very dense, becoming smaller in front. Elytra with sides almost parallel to near apex, shoulders rounded; punctate-striate, punctures round, sharply defined and slightly encroaching on interstices, these scarcely separately convex, much wider than striae, becoming narrower posteriorly, but even there wider than striae. Metasternum with an almost circular depression in middle, surrounded by a flattened ring with small punctures, its middle with a narrow stria; an oblique impunctate depression on each side near hind coxa, sides with crowded punctures. Middle coxae widely separated. Length, 3.75—4 mm.

Hab.—Queensland: Brisbane (Mrs. C. Lea).

Somewhat resembling *P. minor*, but punctures on head smaller, prothorax without remnant of a median line and with sparse punc-

tures, punctures of elytra less encroaching on interstices, and metasternum with a round median depression.

SAPROSITES NITIDICOLLIS, Macl. (*Ammoecius*).

The specimens in his collection that were commented upon and tabled by Blackburn¹ somewhat doubtfully as *Ammoecius nitidicollis*, and which he then transferred to *Saprosites*, agree with the types.

SAPROSITES STERNALIS, Blackb.

I obtained in the Cairns district two specimens that possibly belong to this species (the type of which is in the British Museum); they agree with the description and with the position assigned to the species in Blackburn's table, except that they have a few punctures on the metasternum but normally concealed by the middle legs, and that they are black (with red legs), instead of red; but as *S. mansuetus*, *S. mendax* and *S. nitidicollis* all have black (or blackish) and reddish forms, it is probably that *S. sternalis* similarly varies.

SAPROSITES MESOSTERNALIS, sp. nov.

Black, highly polished, legs dark castaneous, antennae and palpi paler.

Head wide and strongly convex, margins narrow but dilated near eyes (these partly visible from above); with numerous small but rather sharply defined punctures, but becoming indistinct near apical emargination. Prothorax about once and one-half as wide as long, margins rather narrow, hind angles rounded off; with numerous rather large, irregularly distributed punctures, and many very small ones. Elytra about twice the length of prothorax; regularly striate-punctate, interstices impunctate; shoulders dentiform. Mesosternum with intercoxal process narrow, then dilated and deflected, and then largely dilated and convex, with punctures only on its sides. Legs rather short and stout; front tibiae acutely tridentate externally. Length, $3\frac{3}{4}$ — $4\frac{1}{4}$ mm.

Hab.—Lord Howe Island (A. M. Lea).

The mesosternum is on the same plane as the metasternum only so far as the intercoxal process is concerned, the front part largely bulges out and encroaches upon the prosternum (much as in *S. nitidicollis* and *S. mansuetus*), the convex portion being about as large as one of the front femora. In Blackburn's table it would be associated with *mansuetus*, from which it differs in being considerably larger (it is larger than any species previously recorded from Australia) and with different prothoracic margins and punctures; the large prothoracic punctures are absent from the sides, and from about the apical fourth, where the small ones are rather dense. The majority of the specimens before me are black or almost so, but one is of a rather dark castaneous, and others have the front of the

1. Blackburn, Proc. Roy. Soc. Vic., 1904, pp. 175, 177, 178.

head obscurely diluted with red. Six specimens were obtained on the island (mostly on Kentias), and two were reared from Kentia stems brought to Adelaide; there are three in the Australian Museum, one labelled as from Mount Ledgbird.

SAPROSITES CASTANEUS, sp. nov.

Dark castaneous and highly polished, appendages somewhat paler.

Head wide and strongly convex, margins narrow but suddenly triangularly dilated near eyes (these partially visible from above); punctures rather numerous and small but sharply defused, becoming more numerous but less distinct in front. Prothorax about once and one-half as wide as long, margins rather narrow, hind angles almost rectangular; with moderately large punctures and many of smaller size. Elytra strongly striate-punctate, interstices impunctate. Mesosternum narrow between coxae and thence almost evenly dilated to apex; without discal punctures. Legs rather stout; from tibiae strongly tridentate externally. Length, $2\frac{3}{4}$ —3 mm.

Hab.—Lord Howe Island (A. M. Lea).

The mesosternum between the coxae is rather narrow and convex, but dilates evenly forward, somewhat as in *S. mendax*, but the species is considerably smaller than *mendax* (or any other species tabled by Blackburn) and the basal angles of the prothorax are almost rectangular; the punctures in the elytral striae are larger and the interstices are narrower than in *mendax*, *S. mansuetus* or *S. nitidicollis*. From the preceding species it is readily distinguished by its much smaller size and very different punctures. The larger punctures on the pronotum are numerous but irregularly distributed, and become smaller towards the apex; there are also many small punctures scattered about, but becoming rather dense towards the apex. Six specimens were obtained.

SAPROSITES CLYPEALIS, sp. nov.

Dark castaneous-brown, antennae palpi and legs reddish.

Head with dense and rather small but sharply defined punctures, becoming granulate in front; apex widely and rather shallowly notched. Prothorax almost twice as wide as long, sides moderately rounded, front angles feebly produced, hind ones rounded off, sides and base finely margined, a shallow depression near each front angle; punctures about apex much as on base of head, but becoming larger elsewhere. Elytra parallel-sided to near apex, shoulders very feebly armed; striate-punctate, interstices much wider than striae, not separately convex, crenulate internally, each with one or two irregular rows of small punctures, on apical slope becoming narrower, separately convex and with stronger punctures. Metasternum with a narrow, deep median stria, with rather small but distinct punctures scattered about and becoming denser on sides. Mesosternum with a wide intercoxal process, with a narrow, shining, median carina. Length, 3 mm.

Hab.—Queensland: Cairns (E. Allen).

The hind angles of prothorax rounded off distinguish the species from *S. mendax*, the elytral interstices are also wide, and with more distinct punctures, and those in the striae are much smaller; *S. mansuetus* and *S. nitidicollis* which have somewhat similar hind angles, have elytral interstices narrower and with less distinct punctures, and the striae deeper with much larger punctures; the punctate metasternum distinguishes from the description of *S. sternalis*.

SAPROSITES PYGIDIALIS, sp. nov.

Opaque brownish-red, antennae and palpi paler.

Head wide, with crowded and rather small but mostly asperate punctures; clypeal suture rather feeble in middle but distinct elsewhere; front rather shallowly incurved to middle. Prothorax twice as wide as long, sides widely margined except near base, where the hind angles are oblique, front angles feebly produced; with crowded and fairly large, but rather shallow punctures, becoming smaller in front. Elytra parallel-sided to near apex, about the width of head and much narrower than prothorax, each shoulder with a small but rather acute tooth; punctate-striate, punctures rather large but not very conspicuous, interstices separately convex, wider than striae and with small punctures, becoming narrower posteriorly, but even there slightly wider than striae. Metasternum with a subcliptic median depression containing a narrow median stria; with dense and sharply defined punctures, becoming crowded and asperate on sides. Mesosternum with intercoxal process very wide, in front semicircularly impressed, from the impression a narrow carina directed backwards to middle, and then bifurcated to base. Abdomen with rather coarse punctures; pygidium with two distinct cavities separated by a median carina. Femora densely punctate, grooved for partial reception of tibiae. Length, 4.5 mm.

Hab.—New South Wales: Tamworth (A. M. Lea).

By Blackburn's generic table this species could only be referred to *Saprosites* or to a new genus, and although its opaque derm with wide prothoracic margins cause it to differ considerably in appearance from all other Australian species of *Saprosites*, it may, for the present, be referred to it; from *Euparia* it differs in the mesosternum being almost on the same plane as the metasternum. With the head in its normal position the eyes are almost entirely concealed, both from above and below.

EUPARIA SQUAMOSA, sp. nov.

Black, opaque; palpi and parts of legs more or less castaneous, antennae flavous. Densely clothed with more or less muddy-brown scales.

Head wide, apex very feebly incurved to middle, sides suddenly and strongly narrowed towards base; with crowded and rather coarse but more or less concealed punctures. Eyes small, narrow and finely faceted, not visible from above. Prothorax about once and

one-fourth as wide as long, margins widely explanate, but suddenly narrowed towards and terminated before base, front angles obtusely produced; with several feeble discal impressions; punctures crowded and irregular but more or less concealed; with an irregular median carina. Elytra with large more or less concealed punctures; interstices very irregular. Mesosternum wide between coxae, dilated and depressed to apex, finely granulate, with a narrow median carina. Metasternum with a narrow groove along middle, where the length is considerably less than that of the mesosternum; with crowded punctures. Abdomen with crowded punctures. Front femora stout, strongly inflated near middle, middle pair moderately stout, the others thinner; front tibiae strongly tridentate at and near apex, the others moderately long, rather thin and curved but dilated at apex, hind pair with two unequal spines at apex; basal joint of hind tarsi almost the length of the following ones combined, and more than one-third the length of the tibiae. Length, 5—5.25 mm.

Hab.—Lord Howe Island (A. M. Lea).

"The dorsal surface of elytra having a basal edging" regarded by Blackburn as an important generic character in the *Aphodiides* is certainly a rather unsatisfactory one to use, as the basal edging is usually concealed when the elytra are closely applied to the prothorax. Specimens of the present species do not appear to have a basal edging unless the elytra are forced aside from the prothorax, when a feeble and interrupted one becomes visible; the widely separated middle coxae would, regarding the species as belonging to B of this table², associate the species with *Proctammodes*, with which it has scarcely anything else in common; but regarding it as belonging to BB, the strongly flattened prothoracic margins would associate it with *Euparia*; with which it would also be associated in Leconte's table³; it is therefore referred to that genus, although with considerable doubt, as probably a new one should have been proposed for it; certainly it doesn't look at all close to any of the species of *Euparia* figured by Schmidt. From *E. olliffi* (the only species previously recorded from Australia) it is at once distinguished by its dense clothing and tuberculate elytra. The widest part of the prothoracic flange is near the apex, where it is rather more than one-third the width from the side to the middle; the base of the pronotum as seen obliquely from in front appears to be in six obtuse lobes; the elytral interstices are irregularly broken up so as to resemble flattened tubercles, but posteriorly the tubercles are larger, more pronounced and longitudinally distant from each other, the sutural interstice is almost regular throughout, but all the others are very irregular; the medio-apical portion of the head is glabrous, and has much smaller punctures than elsewhere. Seven specimens were obtained from fallen leaves, and most of them are so encrusted with mud (which cannot be removed without removing many of the scales also) that the punctures (and

2. Blackburn, Proc. Roy. Soc. Vic., 1914, p. 150.

3. Leconte, Class. Col. N. Am., part I., p. 127.

4. Schmidt, Wytzman's Gen. Insect, fasc. 110, pl. II.

finer sculpture generally) are more or less concealed; the scutellum is generally covered with mud, but on two specimens is seen to be small, narrow and shining.

In Arrow's table of certain families of *Scarabaeidae* (Trans. Ent. Soc. Lond., 1909, p. 485), one of the characters used for separating the *Aphodiides* from the *Coprides* was the "mid-coxal contiguous" of the former; but in *Proctammodcs*, *Atacnius*, *Saprus*, *Saprosites* and *Psammодиус*, they are conspicuously and usually widely separated.

PSAMMODIUS RUGICOLLIS, MacL. (*Ammoecius*.)

P. australicus, Blackb.

Ammoecius rugicollis of Macleay is a *Psammодиус*, and the species subsequently named *P. australicus* by Blackburn.

PSAMMODIUS LITORALIS, sp. nov.

Bright reddish-castaneous, antennae paler, parts of legs infuscated.

Head closely covered with large granules, except at base and on sides of clypeus; front rather deeply notched. Prothorax strongly convex, almost twice as wide as long, sides moderately rounded, front angles obtusely produced, hind ones rounded off, sides and base distinctly margined; with fairly large punctures, transversely conjoined to form a groove near apex, but interrupted in middle, another groove across middle, interrupted in middle and terminated before sides, a few punctures conjoined to form a short median line, and a few irregularly distributed. Elytra with sides feebly dilated to beyond the middle; punctate-striate, interstices separately convex and much wider than striae, but about the same width on apical slope. Metasternum with a deep median line and a few scattered punctures. Length, 2.75 mm.

Hab.—New South Wales: Gosford, on sea-beach (H. J. Carter).

Allied to *P. rugicollis* and *P. pachypus* but at once distinguished by the prothoracic punctures; in addition to those forming grooves on the type there are about six free ones, on a second specimen the grooves are much the same, but there are more free ones.

PSAMMODIUS PACHYPUS, sp. nov.

Castaneous and shining, legs and antennae paler, discs of head and of prothorax somewhat infuscated.

Head rather wide and convex, margins rather narrow, suddenly terminated at eyes (these distinct from above); basal third with small punctures, elsewhere conspicuously granulate. Prothorax about once and one-half as wide as the median length and about twice that of the sides; margins very narrow, hind angles strongly rounded; with coarse, irregularly distributed punctures and some small ones. Elytra strongly punctate-striate, punctures in striae rather narrow.

Legs very short and stout; basal joint of hind tarsi much shorter than apical width of tibiae. Length, 2½ mm.

Hab.—Lord Howe Island (A. M. Lea).

Smaller than any of the species tabled by Blackburn, but in his table would be associated with *P. obscurus*, from which it also differs in being more brightly coloured, punctures of upper-surface smaller, and margins of prothorax not quite the same. There are no regular sulci on the pronotum, but near the apex there is a narrow impression on each side (not traceable across the middle) that appears to be made of conjoined punctures, there is also a vague longitudinal medio-basal impression containing punctures.

RHYSSEMUS RHIZOPHAGUS, sp. nov.

Black, front of head and of prothorax very narrowly, antennae palpi and tarsi more or less obscurely reddish. Prothorax at base and sides fringed with short, stout setae.

Head rather closely covered with conspicuous granules, several shallow depressions at base, front moderately incurved to middle. Prothorax about three-fifths as wide as long, sides feebly rounded and crenulated, front angles slightly produced, hind ones obtuse, a deep transverse submedian impression terminated some distance from sides, a fairly deep impression near sides in front, becoming shallower and dividing into two parts across middle, near base with two very feeble transverse impressions, closed near middle by the sides of a deep median impression, which becomes shallower and disappears before apex; surface closely covered with granules and punctures. Elytra subparallel-sided to near apex; interstices appearing as closely placed rows of small granules. Metasternum shining in middle, near middle coxae granulate-punctate, elsewhere opaque and densely asperate-punctate. Length, 3—4 mm.

Hab.—Western Australia: Swan River, noted as eating roots of couch grass (J. Clark), Bunbury (R. Helms and A. M. Lea), Vasse River, in flood debris (Lea).

Owing to transverse impressions the prothorax is traversed by four irregularly granulated ridges, of which only the one before the submedian groove is at all well defined; the one behind that groove is interrupted at the middle, with its inner ends curved backwards so as to close the feeble subbasal grooves. The elytral interstices are broken up into rows of granules, those on the even interstices are smaller and more distantly placed than on the others, the odd interstices are more elevated than the even ones, and the fifth and ninth more than the others, with the intervals between the granules more distant so that they appear more as interrupted costae. The legs, as a rule, are not as dark as the rest of the body, but, except for the tarsi, they are seldom distinctly reddish; the tip of the abdomen is usually obscurely diluted with red. One small specimen is entirely of a pale, dingy reddish-brown, two others have the elytra dark reddish-brown, but most of the specimens are deep black, with the elevated parts shining and the depressed parts opaque.

RHYSEMUS INSIGNICOLLIS, sp. nov.

Piceous-brown or blackish, head (partly or entirely), legs and tip of abdomen reddish. Prothorax with a fringe of stiff short setae at base and sides.

Head with dense and well-defined granules, near base with several oblique impressions; base itself with dense punctures; front rather widely notched. Prothorax about four-fifths as long as wide, sides gently rounded, front angles slightly produced, hind ones rounded off; with several transverse, opaque depressions, separated by smooth, shining ridges, but surface more or less granulate about sides. Elytra parallel-sided to near apex, shoulders feebly armed; striae narrow and deep; interstices punctate-granulate, the suture smooth throughout. Metasternum with a deep median stria which is dilated posteriorly, the sides opaque and granulate-punctate. Length, 3—3.25 mm.

Hab.—Queensland: Cairns district (C. J. Wild and Blackburn's collection), Townsville (F. P. Dodd), Thursday Island (N. B. Tindale).

Two specimens are almost black. Of the transverse ridges on the prothorax the first is feeble and subapical, the second and third are continuous across middle and terminate some distance from the sides, the fourth is interrupted in the middle, with its inner ends turned backwards so as to close the subbasal impressions, and the fifth and sixth are close together, subbasal and not much more distinct than the first; there are, therefore, three very conspicuous ridges and three less conspicuous ones.

RHYPARUS, Westwood, Trans. Ent. Soc. Lond., IV., p. 240.

This genus, distinct by six longitudinal ridges on the prothorax, and widely distributed in the Malay Archipelago, can now be recorded as Australian.

RHYPARUS AUSTRALIAE, sp. nov.

Black or blackish, legs obscurely reddish, antennae and palpi paler.

Head with four longitudinal ridges, the median ones interrupted in middle and terminated before apex, the outer ones also interrupted in middle and then obliquely directed to sides; base with crowded but not sharply defined punctures, sides in front of eyes dilated and concave, then somewhat sinuous to apex, which is truncated. Prothorax not much wider than long; with six narrow, longitudinal ridges, the median pair closer together on apical half than on basal half, the outer pair sinuous, the intermediate pair interrupted in a transverse depression near apical third; each margin with a narrow ridge deeply notched at apical third, between it and the outer discal ridge a shorter obtuse ridge, and remnants of other ridges near apex; some fairly large but shallow punctures along middle and a few elsewhere. Elytra about as wide as prothorax, sides feebly

dilated near base; with rows of large subquadrate punctures, odd interstices distinctly elevated above their fellows, the third, fifth and seventh rather abruptly terminated just below summit of apical slope, the ninth curved round and considerably thickened or subtuberculate near suture; between it and apex with larger punctures than elsewhere. Prosternum with two large excavations in front, between them a strong projection, another but smaller and more acute in middle of base. Metasternum with a deep and rather wide median excavation, an irregular excavation behind each middle coxa; with fairly large punctures. Abdomen with most of the segments ridged posteriorly, and at base with a row of very large punctures, apical segment with a narrow longitudinal ridge continued on to pygidium, where it separates small areolets. Front tibiae at apex with two small teeth and an inner spur. Length, 4—4.5 mm.

Hab.—Queensland: Cairns district (F. P. Dodd and A. M. Lea).

The head when at rest is almost vertical, with the large eyes entirely concealed and apparently with six small subtriangular tubercles almost in line with the prothoracic ridges. The elevated parts of the upper-surface have extremely short pale setae (scarcely visible under a magnifying glass), on the under-surface there are also very short setae, on the legs the clothing is more distinct.